Volunteer Lake Assessment Program Individual Lake Reports

RUST POND, WOLFEBORO, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	1,651	**Max. Depth (m):**	12.2	**Flushing Rate (yr^{1})**	0.6
Surface Area (Ac.):	210	**Mean Depth (m):**	7.4	**P Retention Coef:**	0.68
Shore Length (m):	4,800	**Volume (m^{3}):**	6,310,500	**Elevation (ft):**	579

TROPHIC CLASSIFICATION

Year	Trophic class
1981	MESOTROPHIC
2000	OLIGOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

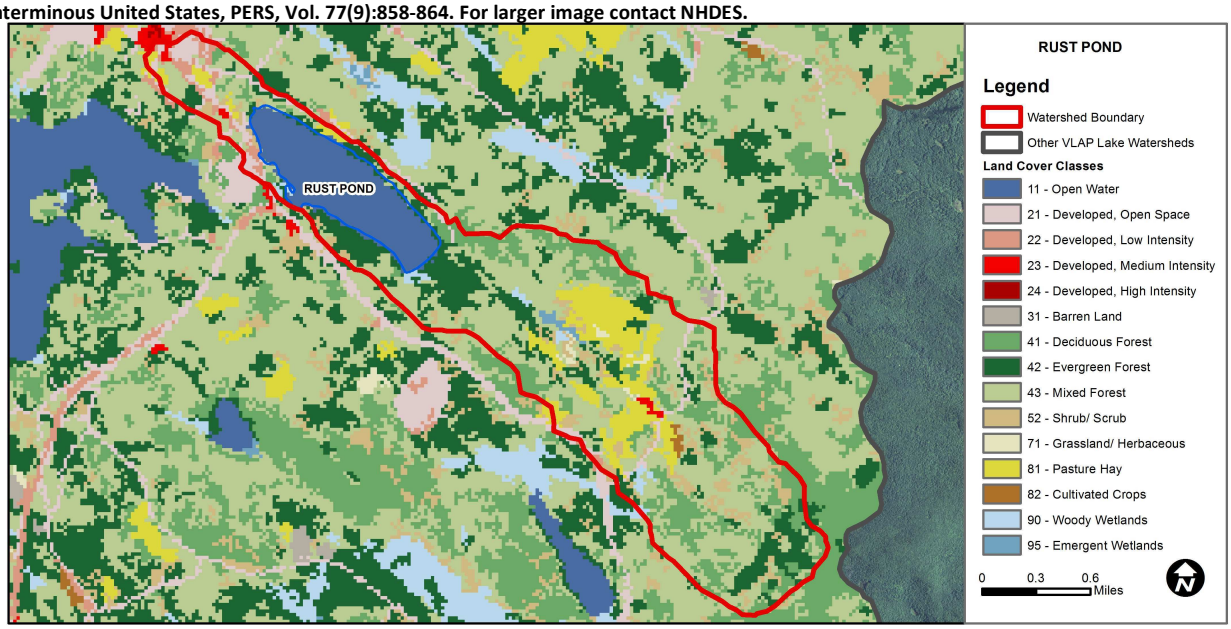
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Dissolved oxygen satura	Encouraging	There are < 10 samples with 0 exceedances of criteria. More data needed.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator.
Primary Contact Recreation	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

RUST POND - WOLFEBORO CAMP SCHOOL BEACH	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.



Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	12.4	Barren Land	0	Grassland/Herbaceous	0.5
Developed-Open Space	3.73	Deciduous Forest	15.42	Pasture Hay	9.68
Developed-Low Intensity	1.45	Evergreen Forest	14.69	Cultivated Crops	0.24
Developed-Medium Intensity	0.48	Mixed Forest	34.07	Woody Wetlands	0.99
Developed-High Intensity	0	Shrub-Scrub	6.04	Emergent Wetlands	0.38

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2014 Data Summary

Observations and Recommendations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll levels remained stable from June to July and decreased in September. Average chlorophyll levels remained low and were less than the state median. Historical trend analysis indicates stable chlorophyll levels since monitoring began.
- **Conductivity/Chloride:** Deep spot, Outlet and Perry Brook conductivity and chloride levels were slightly greater than the state medians but within an average range for NH. North End Inlet conductivity and chloride levels returned to elevated levels after the low levels measured in 2013, and were the highest levels measured in the Inlet since monitoring began. Historical trend analysis indicates significantly increasing (worsening) epilimnetic (upper water layer) conductivity since monitoring began.
- **Total Phosphorus:** Deep spot phosphorus levels remained low throughout the summer and were much less than the state median. Historical trend analysis indicates significantly decreasing (improving) epilimnetic phosphorus since monitoring began. We hope to see this continue! North End Inlet phosphorus levels were slightly elevated in June and the turbidity was also elevated. Potential low flow conditions likely contributed to the elevated levels. Perry Brook phosphorus levels were within an average range for that station.
- **Transparency:** Transparency decreased slightly from June to July following a significant storm event, but improved in August. Average transparency was good and better than the state median. However, historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began.
- **Turbidity:** Deep spot turbidity remained low throughout the summer. North End Inlet turbidity was elevated in June potentially due to low flow conditions. Perry Brook and Outlet turbidities were also slightly elevated in June and sediment was noted in the samples. Perry Brook turbidity was also slightly elevated in September potentially due to stormwater runoff from a recent rain event.
- **pH:** Deep spot pH levels were within the desirable range of 6.5—8.0 units, however hypolimnetic pH has been less than desirable historically. Historical trend analysis indicates relatively stable epilimnetic pH since monitoring began.
- **Recommended Actions:** North End Inlet continues to experience elevated conductivity and chloride levels which could become potentially toxic to aquatic life. Minimizing and reducing the impacts of winter de-icing practices is critical to maintaining a healthy tributary system. The NH Voluntary Salt Applicator license can be obtained through UNH's Technology Transfer Center's Green SnowPro Certification program and is available to road agents and anyone involved in application of winter de-icing materials. Salt application to parking lots in the North End Inlet sub-watershed may be a large contributor to the elevated levels. Work with local winter maintenance companies and high school students to identify alternative solutions to salt application on school property. Information on the Green SnowPro Certification can be found at www.t2.unh.edu/green-snowpro-training-and-certification**.** Keep up the great work!

Table 1. 2014 Average Water Quality Data for RUST POND

Station Name	Alk. mg/l	Chlor-a ug/l	Chloride mg/l	Cond. uS/cm	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	12.7	2.20	12	66.1	5	5.33	5.90	0.73	7.22
Metalimnion				80.5	5			0.75	7.19
Hypolimnion				80.0	9			1.16	7.14
North End Inlet			89	397.7	17			4.12	7.00
Outlet				79.4	6			2.85	7.33
Perry Brook			7	72.8	17			2.89	6.90

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

Historical Water Quality Trend Analysis

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Worsening	Data significantly increasing.	Chlorophyll-a	Stable	Trend not significant; data show low variability.
pH (epilimnion)	Stable	Trend not significant; data moderately variable.	Transparency	Worsening	Data significantly decreasing.
			Phosphorus (epilimnion)	Improving	Data significantly decreasing.